AR201-12615b

ROBUST SUMMARY

ON

TRIS (NONYLPHENYL) PHOSPHITE

CAS No. 26523-78-4

Prepared By:
General Electric Company
One Plastics Avenue
Pittsfield, MA 01201

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ROBUST SUMMARY

TRIS (NONYLPHENYL) PHOSPHITE
CAS No. 26523-78-4

TRIS (NONYLPHENYL) PHOSPHITE CAS No.: 26523-78-4		Information	OECD Study	GLP	Other Study	Estimation Method	Acceptable	SIDS Testing Required
STUDY		**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**
PHYSICAL AND CHEMICAL DATA								
1.0	Melting Point	N						Y
2.0	Boiling Point	N						Y
3.0	Vapor Pressure	Y	N	N	Y	N	Y	N
4.0	Partition Coefficient	N						Y
5.0	Water Solubility	N						Y
ENVIRONMENTAL FATE AND PATHWAY								
6.0	Photodegradation	N						Y
7.0	Stability in Water	N						Y
8.0	Transport and Distribution	N						Y
9.0	Biodegradation	N						Y
ECOTOXICITY								
10.0	Acute Toxicity to Fish	Y	Y	Y	N	N	Y	N
11.0	Toxicity to Algae	Y	Y	Y	N	N	Y	N
12.0	Acute Toxicity to Daphnia	Y	Y	Y	N	N	Y	N
TOXICITY								
13.1	Acute Oral	Y	N	N	Y	N	Y	N
13.2	Acute Inhalation	N						Y
13.3	Acute Dermal	N						Y
14.0	Genotoxicity *In Vivo* (Chrom. Aberrations)	N						Y
15.1	Genotoxicity *In Vitro* (Bacterial Test)	Y	N	N	Y	N	N	Y
15.2	Genotoxicity *In Vitro* (Mammalian Cells)	N						Y
16.0	Repeated Dose	Y	N	N	Y	N	Y	N
17.0	Reproductive Toxicity	Y	N	N	Y	N	N	Y
18.0	Development Toxicity / Teratogenicity	N						Y

PHYSICAL AND CHEMICAL DATA

1.0 MELTING POINT

No studies were found.

2.0 BOILING POINT

No studies were found.

3.0 VAPOR PRESSURE

(a)

Value:	0.00035 Torr
Temperature:	20 °C
Method:	Calculated [ ] Measured [X] ASTM D2879 (isoteniscope)
GLP:	Yes [ ] No [X] ? [ ]
Remarks:	
Reference:	Phoenix Chemical Laboratory Inc., May 19, 1997, Report No. 7 4 24 8, Page 8 of 22.

4.0 PARTITION COEFFICIENT ($log_{10}P_{ow}$)

No studies were found.

5.0 WATER SOLUBILITY

A. Solubility

No studies were found.

B. pH Value, pKa Value

No studies were found.

ENVIRONMENTAL FATE AND PATHWAYS

6.0 PHOTODEGRADATION

No studies were found.

7.0 STABILITY IN WATER

No studies were found.

8.0 TRANSPORT AND DISTRIBUTION BETWEEN ENVIRONMENTAL COMPARTMENTS, INCLUDING ESTIMATED ENVIRONMENTAL CONCENTRATIONS AND DISTRIBUTION PATHWAYS

A. TRANSPORT

No studies were found.

B. THEORETICAL DISTRIBUTION (FUGACITY CALCULATION)

No studies were found.

9.0 BIODEGRADATION

No studies were found.

ECOTOXICOLOGICAL DATA

10.0 ACUTE/PROLONGED TOXICITY TO FISH

Type of Test:	Static [X] Semi-static [ ] Flow-through [ ] Other [ ] Open-system [ ] Closed-system [ ]
Species:	Zebra fish (Brachydanio rerio)
Exposure Period:	96 Hours
Results:	LC_{50} (96h) = <10 mg/L (95% CI = none) LC_{50} (72h) = <10 mg/L (95% CI = none) LC_{50} (48h) = 16 mg/L (95% CI = 12-19 mg/L) LC_{50} (24h) = 29 mg/L (95% CI = 23-36 mg/L) NOEC = <10 mg/L (Not established) LOEC = 10 mg/L
Analytical Monitoring:	Yes [ ] No [X] ? [ ]
Method:	84/449/EEC C.1 Acute toxicity for fish
GLP:	Yes [X] No [ ] ? [ ]
Test Substance:	Irgafos TNPP
Remarks:	Values are based on nominal concentrations and 10 fish per concentration were used. There was no evidence that test concentrations were maintained during exposure. Stock solution to produce the desired test concentration was added to the water and was homogeneously distributed. The fish were then transferred into the 20-liter tank. The dilution water source was dechlorinated tap water. Concentrations of 0, 10, 18, 32, 58, and 100 mg/L were used. The oxygen content ranged from 89-97% at 24 hours, 68-83% at 48 hours, and 60-76% at 72 hours. The pH ranged from 7.3 to 7.9 and the water temperature was 22-23°C, 7.3.79 throughout the experiment. In the pretest, 10 mg/L had no effect to the fish after 96 hours of exposure. In the main test, 10 mg/L showed no effect to the fish after 48 hours. However, the oxygen concentration in the water was determined to be low at 48 hours and a gentle aeration was started at this time. After 72 hours of exposure with the test substance, all fish were dead.
Reference:	Unpublished report (1992) entitled "Report on the acute toxicity test of Irgafos TNPP to Zebra fish (*Brachydanio rerio*)" conducted by Ciba-Giegy Ltd., Basel, Switzerland.

11.0 TOXICITY TO AQUATIC PLANTS (e.g., Algae)

Species:	Green algae (*Scenedesmus subspicatus*)
End-point:	Biomass [ ] Growth rate [X] Other [ ]
Exposure Period:	72 Hours
Results:	Growth: EC_{50} (72h) = > 100 mg/L NOEC = 100 mg/L LOEC = > 100 mg/L
Analytical Monitoring:	Yes [ ] No [X] ? [ ]
Method:	87/302/EEC page 89-94 Algal inhibition test Open-system [ ] Closed-system [X]
GLP:	Yes [X] No [ ] ? [ ]
Test Substance:	TK 10417 (TNPP)
Remarks:	Nominal test concentrations of 0, 1.23, 3.7, 11, 33 and 100 mg/L were used. The stock solution was prepared by mixing 200 mg of the test substance with 80 mL water and 1 mL of a 0.8% alkylphenol-polyglykolether and made up to 100 mL with water. This 100 mL solution was then made up to 1 liter with water. Each test concentration was tested in 3 replicates. Calculated amounts of the stock solution to produce the desired test concentrations were added to the water and were homogeneously distributed. The test substance was homogeneously distributed in the test vessels at all test times and test concentrations. The algae were then transformed into the flasks. The cell densities were measured at 24, 48, and 72 hour. The temperature was continuously measured and maintained at 23 +/- 1°C. The pH was measured at 0 and 72 hours and ranged from 7.8 to 8.1.
Reference:	Unpublished report (1992) entitled "Report on the growth inhibition test of Irgafos TNPP to Green algae (*Scenedesmus subspicatus*)" conducted by Ciba-Giegy Ltd., Basel, Switzerland.

12.0 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

A. Daphnia

Type of Test:	Static [X] Semi-static [ ] Flow-through [ ] Other [ ] Open-system [ ] Closed-system [ ]
Species:	*Daphnia magna* (Straus 1820 strain)
Exposure Period:	48 Hours
Results:	EC_{50} (24h) = 2.6 mg/L (95% CI = 1.08-100.33 mg/L) EC_{50} (48h) = 0.42 mg/L (95% CI = 0.32-0.58 mg/L) EC_{xx} (h) = mg/L NOEC = 0.058 mg/L (48h) LOEC = 0.1 mg/L (48h)
Analytical Monitoring:	Yes [ ] No [X] ? [ ]
Method:	84/449/EEC C.2 Acute toxicity for daphnia
GLP:	Yes [X] No [ ] ? [ ]
Test Substance:	Irgafos TNPP
Remarks:	Calculated amounts of the test material to produce the desired concentrations were added to the water and were homogeneously distributed. Values are based on the nominal concentrations. Parts of the test substance were visible on the surface of the water at concentrations of 0.1-1.0 mg/L. One day before the start of exposure, reproductive daphnia are separated from the young (0-24 hours old)

by sieving all individuals through an 800 μm sieve. This procedure is repeated immediately prior to exposure and the young are retained for the test. The daphnia (4 replicates of 5 daphnia each) were then transferred into the beakers. Cultures of daphnia were maintained in glass vessels containing approximately 2.5 liters of reconstituted water and maintained at 20 +/- 1°C. The oxygen content ranged from 97 to 103%, the pH ranged from 7.8 to 8.0, and the water temperature was maintained at 21-24°C throughout the experiment. The EC-50 values were calculated according to the maximum likelihood method, probit model. EC-values were graphically determined on gausso-logarithmic probability paper.

Reference: Unpublished report (1992) entitled Report on the acute toxicity test of Irgafos TNPP on *Daphnia* (*Daphnia magna* Straus 1820) conducted by Ciba-Giegy Ltd., Basel, Switzerland.

B. Other Aquatic Organisms

No studies were found.

TOXICITY

ACUTE TOXICITY

13.1 ACUTE ORAL TOXICITY

(a)

Type: LD_0 [ ] LD_{100} [ ] LD_{50} [X] LD_{L0} [ ] Other [ ]

Species/Strain: Rat/(Strain not specified)

Value: LD50 calculated to be 19.5 +/- 3.3 grams/kg

Method: Fifty young adult albino rats (10/group) were fasted for 18 +/- 2 hours and given graded doses (8.19 to 32.72 grams/kg) of TNPP. . The sample was prepared as 50% solution in cottonseed oil and doses were administered by stomach tube. Following dosage, the rats were housed individually and observed for appearance, behavior, body weight and mortality for a 14-day period. A nutritionally adequate diet and water were provided ad libitum. Rats that died as well as survivors sacrificed at the end of the experiment were examined for evidence of gross pathology. The LD50 was compared according to the method of Miller and Tainter.

GLP: Yes [ ] No [X] ? [ ]

Test Substance: Tri (polynonylphenyl) phosphite/polygard

Remarks: All rats showed evidence of abdominal pain and catharsis after dosage. Higher doses resulted in urinary incontinence and prostration. Mortality resulted at scattered intervals over the first five days. Growth of survivors was normal. Growth pathological findings included hemorrhagic lesions in the gastric mucosa and/or duodenum in few rats that died and hemorrhagic lungs.

Reference: Unpublished report (1957) entitled Toxicological studies with TNPP: (d) Acute Oral LD50; (e) Subacute Feeding Tests, conducted by Food and Drug Research Laboratories for Naugatuck Chemical Corporation (Division of U.S. Rubber Company).

(b)

Type:	LD_0 [ ] LD_{100} [ ] LD_{50} [X] LD_{L0} [ ] Other [ ]
Species/Strain:	Rat/Holtzman
Value:	>10 mL/kg, TNPP
Method:	Samples were administered orally in corn oil (10 or 50% v/v) by stomach tube to six groups composed of five male albino rats at doses of 0.215, 0.464, 1.00, 2.15, 4.64, and 10.0 g/kg of body weight. Animals were observed 14 days.
GLP:	Yes [ ] No [X] ? [ ]
Test Substance:	Nonylated phenyl phosphite
Remarks:	Rats at the two highest doses showed slight growth suppression.
Reference:	Unpublished report (1965) entitled Acute Oral Administration of Nonylated Phenyl Phosphite (Samples #1 and #2), Mark 488, and Mark 492 to Rats, conducted by Hill Top Research, Inc. Argus Chemical dated June 7, 1965.

(c)

Type:	LD_0 [ ] LD_{100} [ ] LD_{50} [X] LD_{L0} [ ] Other [ ]
Species/Strain:	Rats and mice/(strains not specified)
Value:	>10 mg/kg
Method:	A single oral administration of 10 g/kg was given to rats and mice.
GLP:	Yes [ ] No [X] ? [ ]
Test Substance:	Triphenyl nonylphosphite
Remarks:	No mortality was reported.
Reference:	Majlathova, L. 1981. Evaluation of alkyl phenylphosphite antioxidants by an acute peroral experiment on mice and rats and by epicutaneous and conjunctival test on rabbits. *Bratisl. Lek. Listy.* 76(3): 315-326.

13.2 ACUTE INHALATION TOXICITY

No studies were found.

13.3 ACUTE DERMAL TOXICITY

No studies were found.

14.0 GENETIC TOXICITY IN VIVO

No studies were found.

GENETIC TOXICITY IN VITRO

15.1 BACTERIAL TEST

(a)

Type:	Reverse mutation assay
System of Testing:	*Salmonella typhimurium* strain TA97, TA98, TA100, and TA102 and *Eschericia coli* strain WP2/pKM102
Concentration:	Up to 5,000 ug/plate
Metabolic Activation:	With [ ] Without [ ] With and Without [X] No data [ ]
Results:	

Cytotoxicity Conc:	With metabolic activation:	Not specified
	Without metabolic activation:	Not specified
Precipitation Conc:	No details available	
Genotoxic Effects:	With metabolic activation:	Negative
	Without metabolic activation:	Negative
Method:	Not specified	
GLP:	Yes [ ] No [ ] ? [X]	
Test Substance:	TNPP	
Remarks:	Procedure: Not specified	
	Plates/Test: Not specified	
	Activation System: Not specified	
	Media: Not specified	
	No. Replicates: Not specified	
Reference:	Hachiya, N. 1987. Evaluation of chemical genotoxicity by a series of short-term tests. *Akita J. Med. 14(2)*: 269-292.	

15.2 NON-BACTERIAL IN VITRO TEST (MAMMALIAN CELLS)

No studies were found.

16.0 REPEATED DOSE TOXICITY

(a)

Species/Strain:	Rat/(Strain not specified)
Sex:	Female [ ]; Male [ ]; Male/Female [X]; No data [ ]
Route of Administration:	Oral, Dietary feed
Exposure Period:	12 weeks (90 days)
Frequency of Treatment:	Daily
Post Exposure Observation Period:	Body weight and food intake recorded weekly, inspected daily for appearance and behavior.
Dose:	TNPP in basal food rations at doses of 0, 0.2, 1.0, and 5.0%
Control Group:	Yes [X] No [ ] No data [ ] Concurrent no treatment [X] Concurrent vehicle [ ] Historical [ ]
NOEL:	1% TNPP in food
LOEL:	1-5% TNPP in food
Results:	Two female rats in the 5% group died, possibly due in part to pulmonary pathology seen commonly in lab rats. Hematological or clinical chemistry parameters were within normal ranges for all treatment groups. At necropsy, the only changes reported were in the kidneys of the 5% treatment group and consisted of acute and chronic pyelonephritis with hydronephrosis.
Method:	Groups of 6 rats/sex were fed TNPP at levels of 0.2, 1.0, and 5.0%. Dietary levels were designed to provide each day the equivalent of 1, 5, and 25% of the acute LD50 (established as approximately 20g/kg). Approximately 48 weanling albino rats (27-29 days of age) were divided into four groups and housed individually in metal cages. Body weight and food intake recorded weekly, inspected daily for appearance and behavior. Hematological and chemical examinations were made on the blood of two male and two female rats per group at the 12-week period. All rats that died and all survivors were examined at autopsy for evidence of gross pathology.

GLP:	Yes [ ] No [X] ?[ ]
Test Substance:	Tri (polynonylphenyl) phosphate
Remarks:	There were no effects reported at levels below 5% in the diet. Growth was significantly depressed in both sexes at the 5% level. Two females died in the 5% group (on the 35th and 49th day) and the principle abnormalities seen at necropsy suggested that the deaths were in part due to pulmonary pathology (fibrinous exudate in the thorax and hemorrhagic lungs). Hematological and clinical chemistry examination revealed no effects, even at the highest dietary concentration. The only organ weight measured was the liver and there were no differences noted when compared to the control group. At necropsy, effects on the kidneys in 8 of 9 animals examined in the 5% group (acute and chronic pyelonephritis with hydronephrosis) were reported.
Reference:	Unpublished report (1957) entitled Toxicological studies with TNPP: (d) Acute Oral LD50; (e) Subacute Feeding Tests conducted by Food and Drug Research Laboratories for Naugatuck Chemical Corporation (Division of U.S. Rubber Company).

(b)

Species/Strain:	Rat/(Strain not specified)
Sex:	Female [ ] Male [ ] Male/Female [X] No data [ ]
Route of Administration:	Orally, dietary feed.
Exposure Period:	2 years
Frequency of Treatment:	Daily/ad libitum
Post Exposure Observation Period:	Appearance, behavior, and survival noted daily. Records of body weight made weekly for first 12 weeks, and at 4-week intervals thereafter.
Dose:	Designed to be equivalent to approximately 1000, 3300, and 10,000 ppm in the diet when the rats reached maturity (0, 50, 167, and 500 mg/kg/day)
Control Group:	Yes [X] No [ ] No data [ ] Concurrent no treatment [X] Concurrent vehicle [ ] Historical [ ]
NOEL:	3300 ppm (167 mg/kg/day)
LOEL:	3300-10,000 ppm (rats and dogs)
Method:	200 Weanling rats were distributed into four groups of 25 males and 25 females each. Appearance, behavior, and survival were noted daily. Records of body weight make weekly for first 12 weeks, and 4-week intervals thereafter. At 12 weeks and at approximately half-yearly intervals, clinical examinations were made in 10 rats of each sex in the control and highest groups and 5 of each sex in the two lower groups. Clinical tests included erythrocyte and leukocyte counts; blood hemoglobin, hematocrit, sugar, and nonprotein nitrogen determinations; and urine protein, sugar, and sediment. Blood cholesterol levels and prothrombin time were made at several intervals. Reproductive studies were initiated after 100 days, and 10 representative rats from each sex were placed on the same ration as the parents. Pathology was conducted in F0 rats at the termination of the two-year period, and at various times after the weaning of the second litter. Organ weights included the liver, kidneys, spleen, heart, gonads, adrenals, thyroid, and pituitary. Histopathological examination was performed on the liver, kidney, spleen, adrenals, thyroids, pituitary, heart, stomach, small and large intestine, pancreas, bladder,

	gonads, salivary glands, lymph nodes, lungs, bone marrow, muscle, brain and spinal cord. All tumors were examined microscopically.
Results:	Growth was normal at all dose levels in both sexes except for males receiving the highest dose level. The responses of the descendant generations at 12 weeks showed a slight statistically significant retardation in growth of the F2 and F3 males at the 500 mg/kg level. In females, growth was slightly retarded at the highest dose in the F3 generation. No significant treatment-related changes were observed for mortality, food consumption, hematology, clinical chemistry, or anti-cholinesterase activity. In the reproduction experiment, there were no significant changes in fertility, gestation, viability, or lactation for the F0 animals and the descendant generations. There were no significant changes from control animals for any generation with respect to organ weights and dose-related findings at necropsy.
GLP:	Yes [ ] No [X] ? [ ]
Test Substance:	Tri (polynonylphenyl) phosphite
Remarks:	Combined chronic and reproductive toxicity study.
Reference:	Unpublished report (1961) entitled Two-year feeding studies on TNPP in rats and dogs conducted by Food and Drug Research Laboratories for Naugatuck Chemical Corporation (Division of U.S. Rubber Company).

(c)

Species/Strain:	Dog
Sex:	Female [ ] Male [ ] Male/Female [X] No data [ ]
Route of Administration:	Orally, dietary feed.
Exposure Period:	2 years
Frequency of Treatment:	Daily/ad libitum
Post Exposure Observation Period:	Appearance, behavior, and survival noted daily. Records of body weight made weekly for first 12 weeks and at 4-week intervals thereafter. Neurological tests were performed at 12 weeks and frequently thereafter.
Dose:	Dose set at 0, 0.10, 0.33, and 1.0 % (0, 1000, 3300, and 10,000 ppm respectively)
Control Group:	Yes [X] No [ ] No data [ ] Concurrent no treatment [X] Concurrent vehicle [ ] Historical [ ]
NOEL:	3300 ppm
LOEL:	10,000 ppm
Method:	24 Beagle dogs were separated into four groups of 3 males and 3 females each. Appearance, behavior, and survival were noted daily. Records of body weight were made weekly for the first 12 weeks, and at 4-week intervals thereafter. Clinical tests included erythrocyte and leukocyte counts; blood hemoglobin, hematocrit, sugar and nonprotein nitrogen determinations; and urine protein, sugar, and sediment. Blood cholesterol levels, and prothrombin time were made at several intervals. No reproductive tests were conducted. Organ weights included the liver, kidneys, adrenals, thyroid, and pituitary. Histopathological examination was performed on the liver, kidney, spleen, adrenals, thyroids, pituitary, heart, stomach, small and large intestine, pancreas, bladder, gall bladder, gonads, salivary glands, lymph nodes, lungs, bone marrow, muscle, brain and spinal cord. All tumors were examined microscopically.

Results:	All dogs survived the duration of the study with the exception of one female at the low and one female at the middle treatment group after five months. Replacement dogs were then added to the study. No changes in general appearance, body weights, or food consumption were observed. All hematological parameters were within normal ranges throughout the study with the exception of a slight decrease in the hemoglobin and hematocrit levels of the 1% group at 100 weeks. Clinical chemistry parameters were normal with the exception of elevated cholesterol levels in the females of the high treatment group. Neurological parameters measured (patellar, tonic neck and tonic eye reflexes, and placing, supporting and righting reflexes) were normal at all times. The findings at necropsy revealed no changes in organ weights or significant gross abnormalities. Histopathological examination of the thyroid showed slight hyperplastic changes in one control and one high treatment group dog and a moderate degree of hyperplasia of one dog in the high treatment group. These were not considered treatment related.
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	Tri (polynonylphenyl) phosphite
Remarks:	There were no effects reported at concentrations below 10,000 ppm.
Reference:	Unpublished report (1961) entitled Two-year feeding studies on TNPP in rats and dogs conducted by Food and Drug Research Laboratories for Naugatuck Chemical Corporation (Division of U.S. Rubber Company).

17.0 REPRODUCTIVE TOXICITY

(a)

Type:	Fertility [ ] One generation study [ ] Two generation study [X] Other [ ]
Species/Strain:	Rat/Unknown
Sex:	Female [ ] Male [ ] Male/Female [X] No data [ ]
Route of Administration:	Oral, dietary feed
Exposure Period:	2 years
Frequency of Treatment:	Daily
Postexposure	
Observation Period:	Observed daily.
Premating	
Exposure Period:	Male: 100 days, female: 100 days
Duration of Test:	2 Years
Dose:	Designed to be equivalent to approximately 1000, 3300, and 10,000 ppm in the diet when the rats reached maturity (0, 50, 167, and 500 mg/kg/day)
Control Group:	Yes [X]; No [ ]; No data [ ]; Concurrent no treatment [X] Concurrent vehicle [ ] Historical [ ]
NOEL Parental:	3300 ppm (167 mg/kg)
NOEL F1 Offspring:	3300 ppm (167 mg/kg)
NOEL F2 Offspring:	3300 ppm (167 mg/kg)
Method:	Rats: 200 weanling rats were distributed into four groups of 25 males and 25 females each. Appearance, behavior, and survival noted daily. Records of body weight make weekly for first 12 weeks, and 4 week intervals thereafter. At 12 weeks and at approximately half-yearly intervals clinical examinations were made in 10 rats of each sex in the control and highest

test level groups and 5 of each sex in the two lower levels. Clinical tests included erythrocyte and leukocyte counts; blood hemoglobin, hematocrit, sugar, and nonprotein nitrogen determinations; and urine protein, sugar and sediment. Blood cholesterol levels and prothrombin time were made at several intervals. Reproductive studies were initiated after 100 days, and 10 representative rats from each sex were placed on the same testing as the parents. Full pathology was conducted in F0 rats at various times after the weaning of the second litter.

Results: At the highest concentration, body weight gain was significantly reduced at 12 weeks for the F0, F2, and F3 males and for the F3 females. No significant treatment-related changes were observed for mortality, food consumption, hematology, clinical chemistry, or anti-cholinesterase activity. There were no changes in fertility, gestation, viability, or lactation for the F0 animals and the descendent generations. Also, there were no significant changes from control animals for any generation with respect to organ weights and dose-related findings at necropsy.
General parental toxicity: Reduced body weight at 10,000 ppm
For toxicity to offspring: Reduced body weight at 10,000 ppm

GLP: Yes [ ] No [X] ?[ ]

Test substance: Tri (polynonylphenyl) phosphite

Remarks: Same study as described in Repeated Dose Toxicity (Section 16b)

Reference: Unpublished report (1961) entitled Two-year feeding studies on TNPP in rats and dogs conducted by Food and Drug Research Laboratories for Naugatuck Chemical Corporation (Division of U.S. Rubber Company).

18.0 DEVELOPMENTAL TOXICITY/TERATOGENICITY

(a)

Species/Strain: Chicken/White Leghorn

Sex: Female [ ]; Male [ ]; Male/Female [ ]; No data [X]

Route of Administration: Injection of test materials directly into yolk sac of fertile hen's eggs.

Duration of Test: 5-, 10-, and 18-Day incubation

Exposure Period: One exposure with test substance

Frequency of Treatment: Once.

Dose: 5 mg

Control group: Yes [X] No [ ] No data [ ]
Concurrent no treatment [X] Concurrent vehicle [X] Historical [ ]

NOEL Maternal Toxicity: N/A

NOEL Teratogenicity: 5 mg for TNPP and Weston 618 phosphite

Method: Technique used described by McLaughlin et al., *Tox. Appl. Pharm. 5*: 760 (1963). Material was dissolved in ethyl ether acetone to which Mazola was added to yield a 10% solution and 0.5 mL of the solution was injected into test eggs. Test groups included untreated eggs, eggs drilled with the needle inserted into the egg sac with nothing injected, eggs injected with sterile water, and eggs injected with corn oil.

Results: Injection of 5 mg of either Weston 618 phosphite or TNPP per egg into the yolk sac appeared to have little effect on survival of embryos. Weston 243-B was much more toxic at these doses to the embryos.

	No gross abnormalities were seen in the test groups among chicks that died before hatching or newly hatched chicks.
GLP:	Yes [ ] No [X] ? [ ]
Test Substance:	Weston 618 Phosphite, Lot 18; Tris-nonyl-phenyl phosphite (TN-551-7270); Weston 243-B, Lot 265
Remarks:	Not an adequate developmental toxicity study.
Reference:	Unpublished report (1971) entitled The Effects of Three Samples on the Survival Rate Chick Embryos conducted by Food and Drug Research Laboratories for Weston Chemicals, Inc.